(19) JAPANESE PATENT OFFICE

PATENT ABSTRACTS OF JAPAN

(11) Publication number: **2002289916 A**

(43) Date of publication of application: **04.10.02**

(51) Int. Cl **H01L 33/00**
H01S 5/323

(21) Application number: **2002040698**

(22) Date of filing: **28.04.94**

(30) Priority: **22.03.94 JP 06076514**

(62) Division of application: **09074366**

(71) Applicant: **TOYODA GOSEI CO LTD**

(72) Inventor: **KOIKE MASAYOSHI**
MANABE KATSUHIDE
SHIBATA NAOKI
KATO HISAYOSHI
SASA MICHINARI
ASAI MAKOTO
YAMAZAKI SHIRO

(54) GROUP III NITRIDE SEMICONDUCTOR LIGHT-EMITTING ELEMENT

(57) Abstract:

PROBLEM TO BE SOLVED: To improve luminous intensity and improve the turning blue of lumines cent color.

SOLUTION: A buffer layer 2 of AlN 500 Å is formed on a sapphire board 1, and thereon a high carrier concentration n^+ layer 3 of silicon-doped GaN about 2.0 μm in thickness and $2x10^{18}/cm^3$ in concentration of electrons, a high carrier concentration n^+ layer 4 of silicon-doped $(Al_{x2}Ga_{1-x2})_{y2}In_{1-y2}N$ about 2.0 μm in thickness and $2x10^{18}/cm^3$ in electron concentration, an n layer (luminous layer) 5 of zinc and silicon-doped $(Al_{x1}Ga_{1-x1})_{y1}In_{1-y1}N$ about 2.0 μm in thickness, a p layer 6 of magnesium-doped $(Al_{x2}Ga_{1-x2})_{y2}In_{1-y2}N$ about 1.0 μm in thickness and $2x10^{17}/cm^3$ in hole concentration are formed in the order. An electrode 7 and an electrode 8 made of nickel are formed at the p layer 6 and a high concentration n^+ layer, respectively, and they are electrically isolated form each other by trench 9. The component ratios of Al, Ga, and In in the layers 4, 5, and 6 are selected, so that the lattice constant in each layer may accord with the lattice constant of the layer 3.

COPYRIGHT: (C)2002,JPO